

## **CLAIMS**

### What Is Claimed Is:

1. In a wireless local area network (“WLAN”) which includes a Layer-2 entity, a method for assigning an internet protocol (“IP”) address to a mobile terminal upon entering a basic service area (“BSA”) served by said Layer-2 entity, comprising:

said Layer-2 entity determining, on behalf of said mobile terminal, whether said mobile terminal should continue using a current IP address or begin using a new IP address; and

if said Layer-2 entity determines that said mobile terminal should continue using said current IP address, said Layer-2 entity issuing an instruction, to said mobile terminal, to continue using said current IP address.

2. The method of claim 1, and further comprising:

said mobile terminal issuing a Layer-2 service request to said Layer-2 entity upon entering said BSA;

said Layer-2 entity determining whether said mobile terminal should continue using said current IP address or begin using a new IP address from said Layer-2 service request.

3. The method of claim 2, wherein said Layer-2 service request is formatted to include a current IP address field.

4. The method of claim 3, wherein said Layer-2 service request is formatted to include a mobile IP bit.

5. The method of claim 2, and further comprising:
  - said Layer-2 entity issuing, to said mobile terminal, a response to said Layer-2 service request; and wherein:
    - if said Layer-2 entity determined that said mobile terminal must continue using said current IP address, said response to said Layer-2 service request shall contain an indication that said mobile terminal must continue using said current IP address; and
    - if said Layer-2 entity determined that said mobile terminal must begin using said new IP address, said response to said Layer-2 service request shall contain said new IP address.

6. The method of claim 5, wherein said response to said Layer-2 service request is formatted to include a current IP address field.

7. The method of claim 6, and further comprising:
  - if said Layer-2 entity determines that said mobile terminal must continue using said current IP address, said Layer-2 entity placing a NULL in said current IP address field of said response to said Layer-2 service request.

8. The method of claim 6, wherein said WLAN further includes a Layer-3 entity and further comprising:

- if said Layer-2 entity determined that said mobile terminal must begin using said new IP address, said Layer-2 entity issuing a request, to said Layer-3 entity, for said new IP address; and upon receiving said new IP address, said Layer-2 entity placing said new IP address in said current IP address field of said response to said Layer-2 service request.

9. The method of claim 8, wherein said Layer-2 entity receives said new IP address from said Layer-3 entity.

10. The method of claim 8, wherein said Layer-2 service request is an association request message and said response to said Layer-2 service request is an association response message.

11. The method of claim 8, wherein said Layer-2 service request is a reassociation request message and said response to said Layer-2 service request is a reassociation response message.

12. In a wireless local area network (“WLAN”) which includes an access router (“AR”), at least one access point (“AP”) served by said AR, an internet protocol (“IP”) domain served by said AR and at least one basic service area (“BSA”), each one of said at least one BSS served by a corresponding one of said at least one AP, a method for assigning an IP address to a mobile terminal entering a first BSA of said WLAN, comprising:

upon a mobile terminal entering a first BSA served by an AP, said AP determining whether said MS has roamed into a new IP domain; and

if said AP determines that said mobile terminal has not roamed into a new IP domain, said AP instructing said mobile terminal to use a first IP address, said first IP address used by said mobile terminal prior to entry, of said mobile terminal, into said first BSA.

13. The method of claim 12, and further comprising said mobile terminal forwarding an association request to said first AP upon entering said first BSS.

14. The method of claim 13, wherein said association request includes a first field which holds said first IP address for said mobile terminal.

15. The method of claim 14, and further comprising said AP inserting a NULL into said first field upon determining that said mobile terminal has not roamed into said new IP domain.

16. The method of claim 14, wherein said association request further includes a second field which holds a mobile IP bit for indicating if said mobile terminal is a mobile IPv4 or a mobile IPv6 client.

17. The method of claim 12, and further comprising said mobile terminal forwarding a reassociation request to said first AP upon entering said first BSA.

18. The method of claim 17, wherein said reassociation request includes a first field which holds said first IP address for said mobile terminal.

19. The method of claim 18, and further comprising said AP inserting a NULL into said first field upon determining that said mobile terminal has not roamed into said new IP domain.

20. The method of claim 18, wherein said reassociation request further includes a second field which holds a mobile IP bit for indicating if said mobile terminal is a mobile IPv4 or a mobile IPv6 client.

21. The method of claim 12, and further comprising:  
if said AP determines that said mobile terminal has roamed into a new IP domain, said AP issuing a request, to an AR serving said AP, for a second, new, IP address for said mobile terminal; and

upon receiving said second IP address for said mobile terminal, said AP instructing said mobile terminal to use said second IP address.

22. The method of claim 21, wherein said AP instructing said mobile terminal to use said second IP address further comprising said AP forwarding said second IP address to said mobile terminal.

23. The method of claim 22, and further comprising:

said mobile terminal forwarding either an association request or a reassociation request to said first AP upon entering said first BSA, said association request and said reassociation request both including a first field which holds said first IP address for said mobile terminal and a second field which holds a mobile IP bit for indicating if said mobile terminal is a mobile IPv4 or a mobile IPv6 client; and

said AP returning either an association response or a re-association response to said mobile terminal, said association response and said re-association response both including a first field which holds said second IP address for said mobile terminal.

24. The method of claim 23, wherein a dynamic host configuration protocol (“DHCP”) server is coupled to said AR, and further comprising:

upon determining that said mobile terminal has roamed into a new IP domain, said AP issuing an IP assignment request to said DHCP server via said AR;

upon assigning said second IP address to said mobile terminal, said DHCP server forwarding said second IP address to said AP via said AR; and

said AR inserting said second IP address received from said DHCP server into said first field of either said association response or said reassociation response.

24. The method of claim 23, wherein said mobile terminal is a IPv4 client.

25. The method of claim 23, wherein a foreign agent (“FA”) is coupled to said AR and further comprising:

upon determining that said mobile terminal is a mobile IP client that has roamed into a new IP domain, said AP issuing an IP assignment request to said FA via said AR;

said FA forwarding a third IP address, assigned to said FA, to said AP via said AR, said AP designating said third IP address as a care-of address (“CoA”) for said MS; and

said AR inserting said CoA address into said first field of either said association response or said re-association response.

26. The method of claim 25 wherein said mobile terminal is a mobile IPv4 client.

27. The method of claim 23, and further comprising:

upon determining that said mobile terminal has roamed into a new IP domain, said AP forwarding a medium access control (“MAC”) address and said first IP address to said AR; said AR comparing said received MAC address to MAC address caches for neighboring APs;

said AR refusing registration of said mobile terminal if said received MAC address matches a MAC address maintained in said MAC address cache for one of said neighboring APs

30. The method of claim 29, and further comprising:

if said received MAC address does not match a MAC address maintained in said MAC address cache for one of said neighboring APs, said AR generating an IP address for said mobile terminal.

31. The method of claim 30, wherein said mobile terminal is an IPv6 client.

32. The method of claim 30, wherein said mobile terminal is a mobile IPv6 client.